CO_2 CAPTURE PROJECT

Public Perception of Carbon Dioxide Capture and Storage: Prioritised Assessment of Issues and Concerns

Summary for Policy-Makers

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PROJECT TEAM

Project Management – Iain Wright
Australia and New Zealand – Peta Ashworth
China –Sun Xin, Li Di, Zhu Yizhong and Xi Liang
Europe – Jason Anderson
India – Simon Shackley
Japan – Kenshi Itaoka
North America – Sarah Wade
South Africa – Joe Asamoah
Regional Coordination – David Reiner

EXECUTIVE SUMMARY

At their Gleneagles summit in July 2005, the G8 leaders asked the International Energy Agency (IEA) and the Carbon Sequestration Leadership Forum (CSLF) to work together to accelerate the development and commercialisation of CO_2 Capture and geological Storage (CCS) technology. Article 14(a) of the Gleneagles communiqué encouraged IEA/CSLF to "work with broader civil society to address the barriers to public acceptability of CCS technology".

This report provides a prioritised assessment of perceptions and issues affecting the deployment of CCS. It recommends strategies to address those issues and to develop regulatory and policy frameworks for CCS. Perceptions and issues were surveyed by region (North America, Europe, Australia and New Zealand, Japan, China, India and South Africa) and by stakeholder group (Non-Government Organisations (NGOs), Public, Government, Industry, and Research and Development (R&D) organisations). Regional reports are provided as appendices. A prioritised, regional database of opinion-formers and policy-makers was also prepared.

The maturity of understanding of CCS varies widely between regions and stakeholder groups, however, the perceptions and issues affecting the deployment of CCS are (in order of priority):

1. **Cost of deployment**: CCS projects are large compared to some other low-carbon options (solar panels, hybrid cars) and therefore require high capital investments, though on a unit basis, their cost (per tonne CO_2 avoided) may be significantly lower.
2. **Scale of deployment**: Small-scale CCS deployment will have little impact, but the feasibility of deployment and effects on the energy system (at a scale that would make a significant difference to climate change), are not well understood.
3. **Perceived risks (to local health and safety):** There are so few operational CCS projects in the world that any perception of local risks, even those not viewed as serious by experts, such as catastrophic leakage of CO_2 from storage, are nevertheless vital to address even at the very earliest stages of development.
4. **Lack of accessible information:** There is relatively little information on CCS that is expressly aimed at the general public. Research has shown that focus groups become more supportive of the technology once they have received basic information and understand the context better.
5. **Supporting policies**: Views on this are the most divided. Those who focus on the potential to reduce the CO_2 impact of fossil fuels, or who believe that fossil fuels will be required to raise living standards in the developing world advocate policies to support CCS. Others see CCS threatening to delay the deployment of renewables.
6. **Adequacy of regulatory frameworks to address the perceived risks:** No region has a comprehensive regulatory framework governing CCS, but several processes are now under consideration.

Strategies to develop regulatory and policy frameworks for CCS need to include:

1. **Implement appropriate commercial incentives for industrial deployment**
2. **Demonstrate comprehensive regulatory frameworks**
3. **Implement industrial-scale demonstration projects**
4. **Resolve long-term liability issues for geologically stored CO_2**
5. **Clarify the role of CCS within a portfolio of climate change mitigation options**
6. **Increase education efforts (media, policymakers)**
7. **Exploit opportunities for international collaboration**

SUMMARY FOR POLICY MAKERS

The Potential Role of CCS in addressing Climate Change

CCS is the term used to describe a set of technologies aimed at capturing carbon dioxide (CO_2) before it enters the atmosphere, compressing it, and injecting it deep underground, and ensuring it remains stored there indefinitely. Conservative estimates by the Intergovernmental Panel on Climate Change (IPCC) and others suggest that storage capacity is unlikely to be a limiting factor for deployment of CCS at scale.

The role that CCS could play in the portfolio of climate change mitigation options, alongside renewable energy, energy efficiency, nuclear energy and others, depends on how costs decline with increasing experience, and to what extent public and political opinion will allow the development of a supportive policy and regulatory environment. Economic modelling indicates that including CCS in the portfolio would lower the costs (and hopefully therefore increase the likelihood) of meeting the greenhouse gas (GHG) concentration stabilisation targets being discussed in the international scientific community.

The Importance of Public Acceptance of using CCS at Scale

CCS offers an attractive technical solution for mitigating the climate impacts of fossil-fuel combustion. However, there are potential risks directly and indirectly associated with its widespread use. In reconciling the benefits and risks of implementing CCS, stakeholder groups will develop opinions that will inform critical decisions. These groups may include:

- Industry, during the process of developing CCS projects;
- The financial community, in deciding whether to invest in CCS;
- Regulators, in the process of permitting CCS facilities;
- The public, in choosing whether to live near CCS facilities;
- The public and civil society, in discussing whether to accept CCS as a viable climate change mitigation option in the context of other available options; and
- Consumers, by deciding whether they are willing to pay higher prices for low-carbon electricity.

Each of these stakeholders will ultimately be critical in determining the viability of CCS. In short, without broad acceptance, CCS will be seen as a technically feasible but politically unrealistic climate change mitigation opportunity.

The Challenge of gaining Public Acceptance of CCS

Public outreach or education is often confused with public relations. The latter focuses more on one-way sharing of information while the former should be interactive. The steps involved in building public acceptance include the following:

- Raising awareness of CCS;
- Identifying perceptions and concerns;
- Developing and implementing responses (ideally with the help of those who raise the concerns);
- Communicating with the public.

This report reviews the awareness and perceptions of CCS and makes a set of recommendations to help existing communication efforts evolve into efforts to build genuine public acceptance.

Awareness: A Step Towards Acceptance?

The concept of injecting and storing pressurised gas underground is not something people embrace without a degree of understanding. Awareness, or familiarity, with not just CCS but the whole issue of climate change seems to be an important factor in shaping public perceptions of CCS. As people gain familiarity with the various aspects of CCS, say drilling or injection, their comfort level with the technology seems to increase. Likewise, when placed in the context of developing a portfolio response to climate change, public appreciation of the need for CCS increases. In contrast, in the absence of a strong link to climate change, the general response to CCS is ambivalence.

Currently, awareness of climate change, both in terms of its impacts and mitigation options, is minimal in many countries and familiarity with CCS is low or virtually non-existent. However, there are strong signs that awareness and concern about climate change are growing rapidly. Further, the implementation or announcement of commercial scale injection projects and large scale injection research projects combined with the increased discussion of CCS in the international climate community are all contributing to greater coverage of CCS in the media and consideration of the role of CCS in climate policy discussions. Nevertheless, as a new technology and an industrial process with little impact on most of the public, wider recognition may take many years or even decades to achieve.

Who is "The Public" and How Does Acceptance vary Across Regions?

As little as ten years ago, "the public" with regard to CCS would have consisted of two main groups: (i) those in academia and the petroleum industry conducting CCS-related research, and (ii) all others who knew little or nothing about it. In this report, we look at five stakeholder groups: the research and development (R&D) community, industry, policymakers, environmental non-governmental organisations (ENGOs) and the general public. There are other identifiable groups that are either emerging today or will soon emerge, chief among these being the media.

In an effort to provide the foundation for recommendations, this report summarises the trends in these groups as follows:

- The R&D community: largely optimistic about the viability of CCS;
- Industry: interested in CCS as a cost-effective response to climate change;
- Policymakers: mindful of outstanding questions about CCS safety and effectiveness but very interested in finding cost effective climate change solutions;
- ENGOs: frustrated with the slow response to climate change, therefore interested in the potential of CCS, but wary about the implications of its widespread use;
- The general public: generally not aware of CCS, inclined to be wary of new technology.

The survey focuses on seven regions: North America, Europe, Japan, India, Australia and New Zealand, China, and South Africa. From a very general perspective, greater levels of activity and support for CCS are seen in the developed nations than in the developing nations. Europe is investing in CCS R&D as well as policy formation. Australia, New Zealand, the United States and Canada are providing financial support for CCS R&D and considering policy frameworks for CCS. Japan is increasing its support for CCS research and is seeing an increase in public

awareness. For China, India and South Africa, coal-fired power stations are critical to their plans for growth and their efforts to provide basic amenities to their citizens. CCS would therefore be important in allowing for rapid economic development drawing on significant indigenous coal resources, while limiting emissions. The developing countries surveyed have little experience with CCS but, assuming CCS does not impose significant costs and hinder development, they are interested in the potential for reductions from CCS to be included in global emissions reduction programmes such as the Clean Development Mechanism (CDM).

Overall, public awareness of CCS is low, but there is growing interest in CCS among other key stakeholder groups in most regions. In spite of this growing interest, there is also widespread recognition that incentives will be needed to support deployment.

What are the Most Important Concerns and Issues?

Concerns that will impact the deployment of CCS are presented in Tables 1 and 2 (at the end of this section), sorted by region and by stakeholder group. In order of priority, the key concerns are:

1. **Cost of Deployment** – The expected high costs of deployment were the most important concern and common to all regions, although not all stakeholders shared the same recommendations on how to proceed. Many NGOs feel there is a potential need for CCS technology in the future and so support efforts to reduce costs. Others believe it is a mistake to invest significant resources into R&D for CCS instead of deploying other technologies. While industry tends to be optimistic about the cost reduction potential over the coming decades, they recognise that the current costs of deployment exceed the commercial benefits, making it unattractive for them to invest in deployment. Government stakeholders, while supportive of incentives in principle, are reluctant to provide commercial benefits to large energy firms and fear the magnitude and longevity of the commitment required to seriously tackle climate change.

2. **Scale of Deployment** –There are two ways of looking at scale. The first is to ask whether stakeholders understand the scale involved in using CCS to reduce global CO_2 emissions significantly. Second, if people actually understand the magnitudes involved, does that raise additional concerns? We observe that not many stakeholders understand the scale being discussed either spatially or temporally. Those who do appreciate the scale raise a series of concerns around cost, liability and other issues that are not well enumerated or addressed.

3. **Perceived Risks (Local Health and Safety)** – Environmental groups and the general public tend to be most concerned about the local health and safety issues arising from CCS. In contrast, the R&D community are less concerned because, drawing upon their research, they have confidence that appropriate safeguards can be put in place to prevent adverse effects. This difference in views indicates the need for greater engagement between stakeholder groups. Important observations relating to perceived risks include:

    a. In general, stakeholders seem comfortable with the notion that risk of catastrophic leak is relatively small, but it seems clear that any evidence of wholesale leakage would have a very large negative impact on perceptions.

    b. Some significant concerns were not about the risks themselves but about indirect effects, such as reduced property values from proximity to storage areas and the impact of these concerns on siting. There was a common perception across stakeholder groups that siting CCS facilities, including pipelines, will be a major challenge.

   c. Even those risks with a very low probability of occurrence can have a significant influence on public perceptions and need to be taken seriously.

4. **Lack of Accessible Information** – There is relatively little information on CCS that is designed for the public. To date, the mass media in most countries has not shown great interest in the issue. Studies have shown that participants in focus groups become more supportive of CCS technology once they are provided with basic information and a better sense of the overall context of the problem.
5. **Supporting Policies** –There are some who view CCS positively because it provides a means of extending the use of fossil energy in a carbon-constrained world while simultaneously promoting energy security in a petroleum-constrained world. Others view CCS negatively for the same reason that it extends fossil fuel use. These sceptics are also concerned that CCS may supplant renewable energy and stifle the drive towards energy efficiency and new energy alternatives. Many who share this latter perception, however, generally look favourably on the potential for CCS to obviate the need to increase reliance on nuclear energy.
6. **Adequacy of Regulatory Frameworks to Address Risks** – No region has an adequate regulatory framework in place to govern CCS. In most regions implementing projects, existing environmental rules governing drilling, injection and gas transportation are being used to regulate aspects of CCS, but there are no comprehensive rules for CCS or long-term storage. In several countries, the process of developing CCS-specific regulations is underway. It will be critical that these regulatory development processes consider the broader set of perspectives related to CCS rather than focusing more narrowly on the technical issues. Such regulatory development processes need to be consultative and they should be linked to supporting policy development.

Conclusions and Recommendations

Coal is abundant in many countries, so if continued reliance on coal-fired electricity generation is to be reconciled with calls for ever-deeper cuts in emissions governments will need to adopt a far more proactive approach to CCS by addressing the issues and concerns raised in this report. Regardless of the stage of development of CCS within individual regions, there are a number of common recommendations that are relevant to all policy makers and these are outlined below.

1. **Implement Appropriate Commercial Incentives for Industrial Deployment** - The cost of deployment has been identified as the single greatest hurdle to CCS deployment. Governments must devise incentive schemes or regulatory requirements to remove this barrier to implementation. Such schemes may vary between regions, but without them the likelihood of CCS emerging as a major mitigation option is likely to be extremely low.
2. **Develop Comprehensive Regulatory Frameworks -** These are the rules which ensure that the best practices which researchers believe will allow CCS to be used safely and effectively, are actually put into practice. The adoption of such rules will likely increase project quality, as well as improve public confidence in the projects.
3. **Implement Industrial-scale Demonstration Projects -** If the issue of scale is to be addressed then there is a need for investment in more projects – and on a larger scale – to identify the potential of CCS. Increased activity would help ascertain the true infrastructure requirements globally, which in turn would help address both issues of scale and cost.
4. **Resolve Long-term Liability Issues for Geologically Stored CO_2 -** As the storage component is the main focus of health and safety concerns, policy makers need to devise

adequate provisions for long term liability to increase stakeholder confidence in the permanency and security of storage. This would also help to address ENGO concerns regarding the impacts of current decisions on underrepresented groups including future generations.

5. **Clarify the Role of CCS as Part of a Portfolio of Solutions to Climate Change –** The need for CCS as a mitigation strategy is currently being debated. This report suggests that public acceptance of CCS is positively correlated to the perception that CCS provides a pathway for transition to a cleaner energy economy. One difficulty lies in assigning timelines for the transition. Most people involved in CCS agree that it is not a "silver bullet" strategy – CCS alone will not solve our climate change challenges. However, discussions about the potential of the technology are essential and dialogue itself will likely have significant impact on its deployment
6. **Increase Education Efforts -** Stakeholder engagement is often a low priority for project developers and policy makers. However, in some areas, research has demonstrated broad public interest in all forms of energy and a strong public appetite for more information about new energy choices. In still other areas, there is solid evidence that engaging the public on the topic of energy technologies, when set in the context of climate change, generally improves stakeholder attitudes towards CCS. This ultimately results in increased support for demonstration projects. Therefore, government and project developers need to dedicate resources to communicating and engaging the public in discussion about CCS. In addition, an informed media will help to educate the general public and wider community about the CCS. The media will need to be engaged in discussions about CCS to ensure the information they provide is accurate and up to date.
7. **Exploit Opportunities for International Collaboration -** There are already many international collaboration efforts underway. In addition, opinion formers and other key stakeholders' attending international workshops and conferences helps in the dissemination of information about CCS. International collaboration provides opportunities to share investments of research funds and the different learning that results from the range of projects currently being undertaken.

As CCS is in an early stage of development, we must recognise the interaction between our developing knowledge of how it works, and stakeholder opinion of its value. There are a range of real concerns that need appropriate responses, both informational and regulatory. Some opinion will inevitably be nearly intractable (quasi-philosophical differences of opinion about the inherent sustainability of different energy sources), while some is influenced by issues for which evidence is solid in theory but practice is still emerging to bear it out (requiring a more abstract discussion of concepts, such as risk probabilities, which can be complex for most laypeople). Finally, there are indeed simple misconceptions based on lack of familiarity (e.g. the nature of underground storage sites as solid rock rather than vast caverns, or the relative risk of stored CO_2 versus stored natural gas).

Stakeholder confidence is likely to increase with information, but this increase will be even greater if the information they receive contains such words as 'conforms to strict regulations' and 'based on extensive real-world experience', hence the importance of these aspects in the recommendations made in this report. A pre-condition for acceptance of CCS is that all stakeholders, including governments, need to be aware of the magnitude of the climate change challenge. When placed in the context of that challenge, CCS is more likely to be viewed as a part of the solution.

PRIORITISED ASSESSMENT OF CONCERNS AND ISSUES AFFECTING CCS DEPLOYMENT

The two tables below analyse and prioritise the concerns and issues affecting CCS deployment. A key to the abbreviations and colour codes is given below and a short description of each issue is given on the next page.

The issues of greatest concern (those cells coloured red) are shown at the top of the table and those with more positive drivers (green) are at the bottom.

Table 1 is arranged by stakeholder group (Non-Government Organisations -NGOs, Public, Government, Industry, and Research and Development - R&D organisations).

Table 2 presents the same data arranged by region (North America, Europe, Australia and New Zealand, Japan, China, India and South Africa).

Key	
	Not currently driving opinion
	Positive driver of opinion
	Has potential to be a negative driver of opinion
	Negative driver of opinion
*	Strong difference of opinions within stakeholder group
Stakeholder Abbreviations	
R & D	Research and Development
Ind	Industry
Gov	Government
NGO	Non government organisations
P	General Public

1. Cost of Deployment	How much is the expected increased costs for CCS likely to be an issue?
2. Scale of Deployment	Is there enough capacity for storage and do we really understand the implications for infrastructure
3. Perceived Risks	
Dangerous levels of leakage for humans	Will CCS kill or cause other harm to humans?
Impact on ecosystems	Will CCS harm oceans, biodiversity, flora and fauna?
CO2 Pipeline Safety	How important are safety concerns around where pipeliness are sited?
Land use and related issues	How much are liability and the rights of property owners, land use and resource planning an issue?
Capture process/chemicals issues	Concern over the energy intensity and use of various chemicals in the CCS process
Impact on drinking water	The that CCS may acidify drinking water
Concerns about miner safety	A concern about miner safety in relation to CCS and may continue coal mining in China
Effects of natural or induced seismicity	What happens to stored CO2 if there is a natural earthquake. Is CCS likely to cause an earthquake?
CO2 Pipeline Routing	Is the siting of pipelines in certain areas, i.e.built up areas, a concern?
Impacts on property values	Will CCS have a positive impact on property values or negative impact on property values?
Mineral rights / landowner approvals	Who will have overall rights over land once CCS is granted to different companies?
4. Information / Communication	
Importance of broader energy context in shaping attitudes	Discussion of CCS in relation to climate change and other energy technologies, rather than just CCS
Access to information	Is information about CCS available for stakeholders to access?
Information fit for purpose/useful to stakeholder group	Is the material of the appropriate language, of high quality and in the right medium for stakeholders to access?
Are efforts to communicate adequate	Has there been enough communication with the range of stakeholder groups?
5. Policy Hurdles	
Ability of CCS to reduce emissions dramatically in short term	Can CCS reduce GHG emissions quickly and is there enough support to make it happen?
Diversion of efforts from renewable energy	How seriously is CCS being oversold as a silver bullet to the detriment of renewable energy development?
Possible competition with nuclear	Does comparing CCS with nuclear enhance support for CCS?
Impact of EOR on extending oil market	Is using CCS technology for EOR lto extend the oil market ikely to be considered a good thing?
Impact of CCS on extending/expanding coal market	Is using CCS to extend coal industry likely to be considered a good thing?
Full cycle impact of fossil fuel use	What are the environmental effects of extraction, transport and use of fossil fuels as affected by the use of CC
Differential acceptability of different kinds of CCS	How much support is there for CCS for EOR, from coal, oil or gas, Onshore vs offshore. Ocean vs. geological?
CCS is not just a bridging technology	Is CCS a sustainable long term solution or should it only be considered as a bridging strategy?
Energy penalty	Is the true energy penalty for CCS being taken into account when assessing viability of the technology
6. Adequacy of Regulatory Frameworks to Address Risks	Are the current regulatory frameworks in each region appopriate for effective risk management?

Table 1. Traffic lights arranged by stakeholder group

Region	ANZ	NA	EUR	China	SA	Japan	India	ANZ	NA	EUR	China	SA	Japan	India	ANZ	NA	EUR	China	SA	Japan	India
Stakeholder Group	R &D	R &D	R &D	R &D	R &D	R &D	R &D	Ind	Ind	Ind	Ind	Ind	Ind	Ind	Gov	Gov	Gov	Gov	Gov	Gov	Gov
Issue																					
1. Cost of Deployment								*	*	*		*			*	*	*				
2. Scale of Deployment								*			*							*			
3. Perceived Risks																					
Dangerous levels of leakage for humans																					
Impact on ecosystems							*							*						*	*
CO2 Pipeline Safety																					
Land use and related issues																					
Capture process/chemicals issues									*												
Impact on drinking water				*																	
Concerns about miner safety																					
Effects of natural or induced seismicity																					
CO2 Pipeline Routing																					
Impacts on property values																					
Mineral rights / landowner approvals																					
4. Information / Communication																					
Importance of broader energy context in shaping attitudes								*												*	
Access to information																					
Information fit for purpose/useful to stakeholder group																				*	
Are efforts to communicate adequate								*	*							*					
5. Policy Hurdles																					
Ability of CCS to reduce emissions dramatically in short term							*		*				*	*						*	*
Diversion of efforts from renewable energy															*						
Possible competition with nuclear													*		*						
Impact of EOR on extending oil market									*							*					
Impact of CCS on extending/expanding coal market				*					*		*					*					
Full cycle impact of fossil fuel use								*													
Differential acceptability of different kinds of CCS							*							*							*
CCS is not just a bridging technology		*	*					*	*	*						*					
Energy penalty											*		*							*	
6. Adequacy of Regulatory Frameworks																					
Frameworks to Address Risks								*													

Table 1. Traffic lights arranged by stakeholder group

Region	ANZ	NA	EUR	China	SA	Japan	India	ANZ	NA	EUR	China	SA	Japan	India
Stakeholder Group	NGO	NGO	NGO	NGO	NGO	NGO	NGO	P	P	P	P	P	P	P
Issue														
1. Cost of Deployment	*													
2. Scale of Deployment	*													
3. Perceived Risks														
Dangerous levels of leakage for humans														
Impact on ecosystems														
CO2 Pipeline Safety														
Land use and related issues														
Capture process/chemicals issues														
Impact on drinking water														
Concerns about miner safety														
Effects of natural or induced seismicity														
CO2 Pipeline Routing														
Impacts on property values														
Mineral rights / landowner approvals														
4. Information / Communication														
Importance of broader energy context in shaping attitudes														
Access to information														
Information fit for purpose/useful to stakeholder group														
Are efforts to communicate adequate														
5. Policy Hurdles														
Ability of CCS to reduce emissions dramatically in short term	*	*												
Diversion of efforts from renewable energy		*							*					
Possible competition with nuclear		*						*						
Impact of EOR on extending oil market	*		*						*					
Impact of CCS on extending/expanding coal market							*	*	*					
Full cycle impact of fossil fuel use														
Differential acceptability of different kinds of CCS														
CCS is not just a bridging technology	*	*						*						
Energy penalty														
6. Adequacy of Regulatory Frameworks														
to Address Risks														

Table 2. Traffic lights arranged by regions

Region	ANZ	ANZ	ANZ	ANZ	ANZ	NA	NA	NA	NA	NA	EUR	EUR	EUR	EUR	EUR	China	China	China	China	China
Stakeholder Group	R &D	Ind	Gov	NGO	P	R &D	Ind	Gov	NGO	P	R &D	Ind	Gov	NGO	P	R &D	Ind	Gov	NGO	P
Issue																				
1. Cost of Deployment		*	*	*			*	*				*	*							
2. Scale of Deployment		*		*													*	*		
3. Perceived Risks																				
Dangerous levels of leakage for humans																				
Impact on ecosystems																				
CO2 Pipeline Safety																				
Land use and related issues																				
Capture process/chemicals issues							*													
Impact on drinking water																*				
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Impacts on property values																				
Mineral rights / landowner approvals																				
4. Information / Communication																				
Importance of broader energy context in shaping attitudes		*																		
Access to information																				
Information fit for purpose/useful to stakeholder group																				
Are efforts to communicate adequate		*					*	*												
5. Policy Hurdles																				
Ability of CCS to reduce emissions dramatically in short term				*			*		*											
Diversion of efforts from renewable energy			*						*	*										
Possible competition with nuclear			*		*				*											
Impact of EOR on extending oil market				*			*	*		*				*						
Impact of CCS on extending/expanding coal market					*		*	*		*						*	*			
Full cycle impact of fossil fuel use		*																		
Differential acceptability of different kinds of CCS																				
CCS is not just a bridging technology		*		*	*	*	*	*	*		*	*								
Energy penalty																	*			
6. Adequacy of Regulatory Frameworks																				
Frameworks to Address Risks		*																		

Table 2. Traffic lights arranged by regions

Region	SA	SA	SA	SA	SA	Japan	Japan	Japan	Japan	Japan	India	India	India	India	India
Stakeholder Group	R &D	Ind	Gov	NGO	P	R &D	Ind	Gov	NGO	P	R &D	Ind	Gov	NGO	P
Issue															
1. Cost of Deployment		*													
2. Scale of Deployment															
3. Perceived Risks															
Dangerous levels of leakage for humans															
Impact on ecosystems								*			*	*	*		
CO2 Pipeline Safety															
Land use and related issues															
Capture process/chemicals issues															
Impact on drinking water															
Concerns about miner safety															
Effects of natural or induced seismicity															
CO2 Pipeline Routing															
Impacts on property values															
Mineral rights / landowner approvals															
4. Information / Communication															
Importance of broader energy context in shaping attitudes								*							
Access to information															
Information fit for purpose/useful to stakeholder group								*							
Are efforts to communicate adequate															
5. Policy Hurdles															
Ability of CCS to reduce emissions dramatically in short term							*	*			*	*	*		
Diversion of efforts from renewable energy															
Possible competition with nuclear							*								
Impact of EOR on extending oil market															
Impact of CCS on extending/expanding coal market														*	
Full cycle impact of fossil fuel use															
Differential acceptability of different kinds of CCS											*	*	*		
CCS is not just a bridging technology															
Energy penalty							*	*							
6. Adequacy of Regulatory Frameworks															
to Address Risks															